

From: Jeff Tubbs <jeff.tubbs@arup.com>  
To: wtc@nist.gov  
Cc: dlowe@nist.gov  
Subject: WTC Draft Final Report Comment Form for Report: NCSTAR 1

Information Submitted on: 8/1/2005.

Name : Jeff Tubbs  
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Phone : +1 508 616 9992  
Report Number : NCSTAR 1  
Page Number : 210

Paragraph : Recommendation 16

Comment : Arup Comment. We agree; clearly, an effective campaign could make great strides in increasing public awareness of safety procedures and could increase the likelihood of the general public making better decisions in emergency situations. Currently, a large portion of the general public likely considers film and television portrayals of disasters as reality.

This recommendation embodies several components: (1) provide better training and drills for evacuation procedures within individual buildings; (2) provide training for the general public; and (3) develop an evacuation standard (it seems to be implied within the commentary that a standard should be developed). Several issues should be addressed. First, it is unclear which public agencies and non-profit organizations should be involved and what form should the public information campaigns take (i.e. television, radio, or other media). It is suggested that roles be better defined, or suggestions for members of a steering committee should be provided. Second, it is unclear what funding mechanisms could support a consistent comprehensive nationwide educational campaign. While a comprehensive national standard for building emergency planning, and evacuation training and plans would be a marked improvement over the current fragmented bits of information, specific information should be provided so that this recommendation can be moved forward. A joint NFPA / ICC national standard, with representation from AIA, SFPE, NIBS, NCSBCS, BOMA, and CTBUH would effectively include many of the important parties. Lastly, NFPA and ICC should be included within the effected organizations.

Comment Reason :

Revision Suggestion :

2005 WTC Report Comment Application 1.0, dlowe@nist.gov, rev. 6/21/2005

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Page Number : 211  
Paragraph : Recommendation 17  
Comment : We generally agree; however, we recommend that building evacuation strategies be developed through application of comprehensive risk-informed performance analyses for tall or iconic buildings, or for buildings with large populations. Consistently applying this approach could greatly improve safety within America's buildings.

Building codes and the ADA should provide consistent policies for providing safe evacuation policies for wheel chair users and other mobility challenged occupants.

We have several additional comments regarding the implementation of this recommendation.

a) The text of NCSTAR 1-7 report does not critique egress models. The main report discusses specific issues and specific areas for improvements for egress models. We believe that issues such as better modeling merging flows, better characterizing pre-decisional times, better understanding the range of occupant mobility, and better understanding of visibility and egress through smoke and other adverse conditions be should given priority. Perhaps understanding how fatigue affects mobility, as well as fire fighter effectiveness, affect ascend/descending a large number of flights, should be given the highest priority. This is important not only in high rise buildings but also for deep basements where the flows are reversed.

b) We do not agree that models should consider tenability conditions in stairways. Specific measures should be provided to sufficiently protect stairs, so that these protected areas can be used as designed. Assuming that use of the stair could be affected introduces many possible uncertainties and may develop a wide scatter of evacuation times. This scatter would likely exceed our current understanding of key issues such as pre-decisional times and merging flows.

c) The report indicates that counter flow by emergency responders was not a significant delaying factor in the stairs (NISTNCSTAR1-7 Report Section 11.3 item 3). This recommendation seems contrary to that point. We are in favor of accounting for counter flows; however, we are not in favor of providing a dedicated stairway for responder use. During the initial evacuation, a dedicated stairway could be better used for much needed evacuation capacity. Additionally, given likely fatigue severely limiting responder capabilities after ascending many floors, we urge fire departments and standards

organizations to give serious attention to elevator-based fire fighter access systems.

d) From the report, it appears that occupant movement speeds were below that found in the research literature (NISTNCSTAR1-7 Report Section 10.1.2). It is possible, and perhaps likely, that occupant fatigue contributed to this. We recommend investigating the ability of a representative mixed ability population to travel down 40 to 70 or more stories of stairs. Based upon this observation, consideration may need to be given to including rest spaces on stair landings, in locations that will not affect the overall flow of occupants.

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Paragraph : Recommendation 18

Comment : We agree in principal with the recommendation; however, we would recommend a risk-informed performance approach to develop appropriate survivability criteria. We aggress that consistent layouts, standard signage and guidance are essential to facilitate way finding and to develop usable evacuation components.

Exit remoteness, in the context of extreme events, is difficult to effectively require through prescriptive criteria; meaningful separation in one event may not be effective in another type of event. The actual distance achieved depends on the size of the building, and a fixed minimum may simply be unachievable. For instance, consider a tall slender building with stairways located on opposite facades, while this scenario would work well for fires, it may cause additional exposure for external bomb threats. Therefore, while we agree in principal, we suggest Item 1 include and additional qualifier: □.. (1) to maximize remoteness of egress components (i.e., stairs, elevators, exits) while achieving appropriate balance for other building threats, such as blast, or high-wind exposures and without negatively impacting the average travel distance ..□

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Paragraph : Recommendation 19

Comment : One of the clearest messages from the NCSTAR 1-7 report is that more people might have survived if it had been possible for incident management to have gathered a better overall view of the situation, and to have given unambiguous evacuation instructions to occupants. Therefore, we agree with this recommendation. However, we do caution on providing too much information, as this may cause longer pre-decisional times for evacuation. Also, it is imperative that coordinated and consistent information be provided across all media. Due to costs issues associated with the process of listing devices, some of the suggested devices would likely need to be non-listed supplementary devices. Some readers may not appreciate this, so we would recommend providing a brief discussion. We would also suggest including more detail as to what types of messages and updates, or perhaps recommending a task force to make these recommendations.

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Paragraph : Recommendation 20

Comment : We agree that all emerging technologies should be given appropriate review. We advocate that protected elevators should be considered for tall buildings. If this moves forward on a wide scale, then it is imperative that building occupants, as well as the public in general, be trained to correctly use the systems. Consideration should be given to joint training exercises with the emergency services so that all better understand and experience how the system works and what information needs to be transferred. We would caution that emerging technologies pass this rigors imposed by listing agencies before being installed within buildings.

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